```
      |  10      |  20      |  30      |  40      |  50      |  60      |  70      |  80
    1 GATATTGGCT ATTGGCCATT GCATACGTTG TATCCATATC ATAATATGTA CATTTATATT GGCTCATGTC CAACATTACC   80
   81 GCCATGTTGA CATTGATTAT TGACTAGTTA TTAATAGTAA TCAATTACGG GGTCATTAGT TCATAGCCCA TATATGGAGT  160
  161 TCCGCGTTAC ATAACTTACG GTAAATGGCC CGCCTGGCTG ACCGCCCAAC GACCCCCGCC CATTGACGTC AATAATGACG  240
  241 TATGTTCCCA TAGTAACGCC AATAGGGACT TTCCATTGAC GTCAATGGGT GGAGTATTTA CGGTAAACTG CCCACTTGGC  320
  321 AGTACATCAA GTGTATCATA TGCCAAGTAC GCCCCCTATT GACGTCAATG ACGGTAAATG GCCCGCCTGG CATTATGCCC  400
  401 AGTACATGAC CTTATGGGAC TTTCCTACTT GGCAGTACAT CTACGTATTA GTCATCGCTA TTACCATGGT GATGCGGTTT  480
  481 TGGCAGTACA TCAATGGGCG TGGATAGCGG TTTGACTCAC GGGGATTTCC AAGTCTCCAC CCCATTGACG TCAATGGGAG  560
  561 TTTGTTTTGG CACCAAAATC AACGGGACTT TCCAAAATGT CGTAACAACT CCGCCCCATT GACGCAAATG GGCGGTAGGC  640
  641 GTGTACGGTG GGAGGTCTAT ATAAGCAGAG CTCGTTTAGT GAACCGTCAG ATCGCCTGGA GACGCCATCC ACGCTGTTTT  720
  721 GACCTCCATA GAAGACACCG GGACCGATCC AGCCTCCGCG GCCGGGAACG GTGCATTGGA ACGCGGATTC CCCGTGCCAA  800
  801 GAGTGACGTA AGTACCGCCT ATAGAGTCTA TAGGCCCACC CCCTTGGCTT CTTATGCATG CTATACTGTT TTTGGCTTGG  880
  881 GGTCTATACA CCCCCGCTTC CTCATGTTAT AGGTGATGGT ATAGCTTAGC CTATAGGTGT GGGTTATTGA CCATTATTGA  960
  961 CCACTCCCCT ATTGGTGACG ATACTTTCCA TTACTAATCC ATAACATGGC TCTTTGCCAC AACTCTCTTT ATTGGCTATA 1040
 1041 TGCCAATACA CTGTCCTTCA GAGACTGACA CGGACTCTGT ATTTTTACAG GATGGGGTCT CATTTATTAT TTACAAATTC 1120
 1121 ACATATACAA CACCACCGTC CCCAGTGCCC GCAGTTTTTA TTAAACATAA CGTGGGATCT CCACGCGAAT CTCGGGTACG 1200
 1201 TGTTCCGGAC ATGGGCTCTT CTCCGGTAGC GGCGGAGCTT CTACATCCGA GCCCTGCTCC CATGCCTCCA GCGACTCATG 1280
 1281 GTCGCTCGGC AGCTCCTTGC TCCTAACAGT GGAGGCCAGA CTTAGGCACA GCACGATGCC CACCACCACC AGTGTGCCGC 1360
 1361 ACAAGGCCGT GGCGGTAGGG TATGTGTCTG AAAATGAGCT CGGGGAGCGG GCTTGCACCG CTGACGCATT TGGAAGACTT 1440
 1441 AAGGCAGCGG CAGAAGAAGA TGCAGGCAGC TGAGTTGTTG TGTTCTGATA AGAGTCAGAG GTAACTCCCG TTGCGGTGCT 1520
 1521 GTTAACGGTG GAGGGCAGTG TAGTCTGAGC AGTACTCGTT GCTGCCGCGC GCGCCACCAG ACATAATAGC TGACAGACTA 1600
 1601 ACAGACTGTT CCTTTCCATG GGTCTTTTCT GCAGTCACCG TCCTTAGATC TAGGTACCAG ATATCAGAAT TCAGTCGACA 1680
 1680 GCGGCCGCGA TCTGCTGTGC CTTCTAGTTG CCAGCCATCT GTTGTTTGCC CCTCCCCCGT GCCTTCCTTG ACCCTGGAAG 1760
 1761 GTGCCACTCC CAGTGTCCTT TCCTAATAAA ATGAGGAAAT TGCATCGCAT TGTCTGAGTA GGTGTCATTC TATTCTGGGG 1840
 1841 GCTGGGGTGG GGCAGCACAG CAAGGGGGAG GATTGGGAAG ACAATAGCAG GCATGCTGGG GATGCGGTGG GCTCTATGGG 1920
 1921 TACGGCCGCA GCGGCCTTAA TTAAGGCCGC AGCGGCCGTA CCCAGGTGCT GAAGAATTGA CCCGGTTCCT CGACCCGTAA 2000
```

FIG.1A

```
2001  AAAGGCCGCG TTGCTGGCGT TTTTCCATAG GCTCCGCCCC CCTGACGAGC ATCACAAAAA TCGACGCTCA AGTCAGAGGT 2080
2081  GGCGAAACCC GACAGGACTA TAAAGATACC AGGCGTTTCC CCCTGGAAGC TCCCTCGTGC GCTCTCCTGT TCCGACCCTG 2160
2161  CCGCTTACCG GATACCTGTC CGCCTTTCTC CCTTCGGGAA GCGTGGCGCT TTCTCAATGC TCACGCTGTA GGTATCTCAG 2240
2241  TTCGGTGTAG GTCGTTCGCT CCAAGCTGGG CTGTGTGCAC GAACCCCCCG TTCAGCCCGA CCGCTGCGCC TTATCCGGTA 2320
2321  ACTATCGTCT TGAGTCCAAC CCGGTAAGAC ACGACTTATC GCCACTGGCA GCAGCCACTG GTAACAGGAT TAGCAGAGCG 2400
2401  AGGTATGTAG GCGGTGCTAC AGAGTTCTTG AAGTGGTGGC CTAACTACGG CTACACTAGA AGGACAGTAT TTGGTATCTG 2480
2481  CGCTCTGCTG AAGCCAGTTA CCTTCGGAAA AAGAGTTGGT AGCTCTTGAT CCGGCAAACA AACCACCGCT GGTAGCGGTG 2560
2561  GTTTTTTTGT TTGCAAGCAG CAGATTACGC GCAGAAAAAA AGGATCTCAA GAAGATCCTT TGATCTTTTC TACGTGATCC 2640
2641  CGTAATGCTC TGCCAGTGTT ACAACCAATT AACCAATTCT GATTAGAAAA ACTCATCGAG CATCAAATGA AACTGCAATT 2720
2721  TATTCATATC AGGATTATCA ATACCATATT TTTGAAAAAG CCGTTTCTGT AATGAAGGAG AAAACTCACC GAGGCAGTTC 2800
2801  CATAGGATGG CAAGATCCTG GTATCGGTCT GCGATTCCGA CTCGTCCAAC ATCAATACAA CCTATTAATT TCCCCTCGTC 2880
2881  AAAAATAAGG TTATCAAGTG AGAAATCACC ATGAGTGACG ACTGAATCCG GTGAGAATGG CAAAAGCTTA TGCATTTCTT 2860
2961  TCCAGACTTG TTCAACAGGC CAGCCATTAC GCTCGTCATC AAAATCACTC GCATCAACCA AACCGTTATT CATTCGTGAT 3040
3041  TGCGCCTGAG CGAGACGAAA TACGCGATCG CTGTTAAAAG GACAATTACA AACAGGAATC GAATGCAACC GGCGCAGGAA 3120
3121  CACTGCCAGC GCATCAACAA TATTTTCACC TGAATCAGGA TATTCTTCTA ATACCTGGAA TGCTGTTTTC CCGGGGATCG 3200
3201  CAGTGGTGAG TAACCATGCA TCATCAGGAG TACGGATAAA ATGCTTGATG GTCGGAAGAG GCATAAATTC CGTCAGCCAG 3280
3281  TTTAGTCTGA CCATCTCATC TGTAACATCA TTGGCAACGC TACCTTTGCC ATGTTTCAGA AACAACTCTG GCGCATCGGG 3360
3361  CTTCCCATAC AATCGATAGA TTGTCGCACC TGATTGCCCG ACATTATCGC GAGCCCATTT ATACCCATAT AAATCAGCAT 3440
3441  CCATGTTGGA ATTTAATCGC GGCCTCGAGC AAGACGTTTC CCGTTGAATA TGGCTCATAA CACCCCTTGT ATTACTGTTT 3520
3521  ATGTAAGCAG ACAGTTTTAT TGTTCATGAT GATATATTTT TATCTTGTGC AATGTAACAT CAGAGATTTT GAGACACAAC 3600
3601  GTGGCTTTCC                                                                          3610
          |  10     |  20     |  30     |  40     |  50     |  60     |  70     |  80
```

FIG.1B

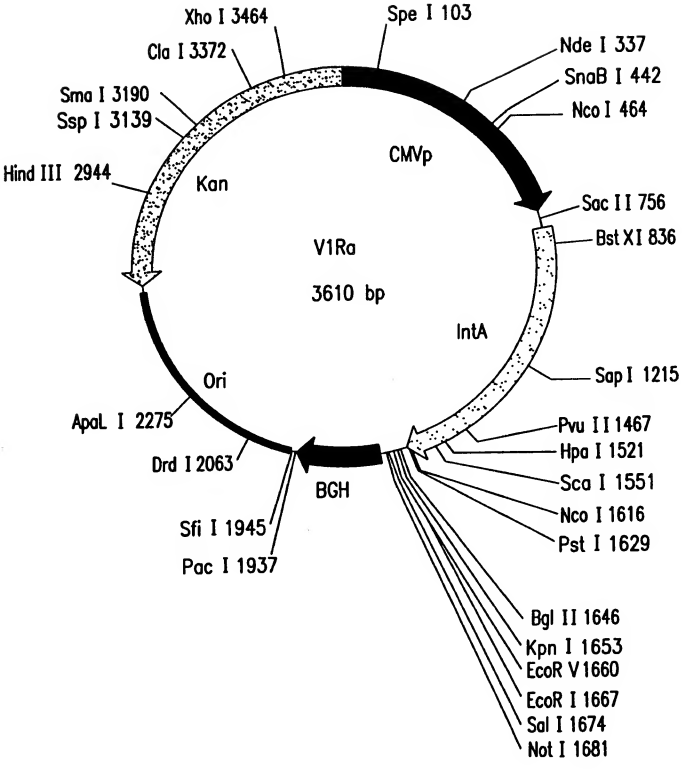
Xho I 3464
Spe I 103
Cla I 3372
Nde I 337
SnaB I 442
Sma I 3190
Ssp I 3139
Nco I 464
CMVp
Hind III 2944
Kan
Sac II 756
Bst XI 836
V1Ra
3610 bp
IntA
Sap I 1215
Ori
Pvu II 1467
ApaL I 2275
Hpa I 1521
Drd I 2063
Sca I 1551
BGH
Nco I 1616
Sfi I 1945
Pst I 1629
Pac I 1937
Bgl II 1646
Kpn I 1653
EcoR V 1660
EcoR I 1667
Sal I 1674
Not I 1681

FIG.2

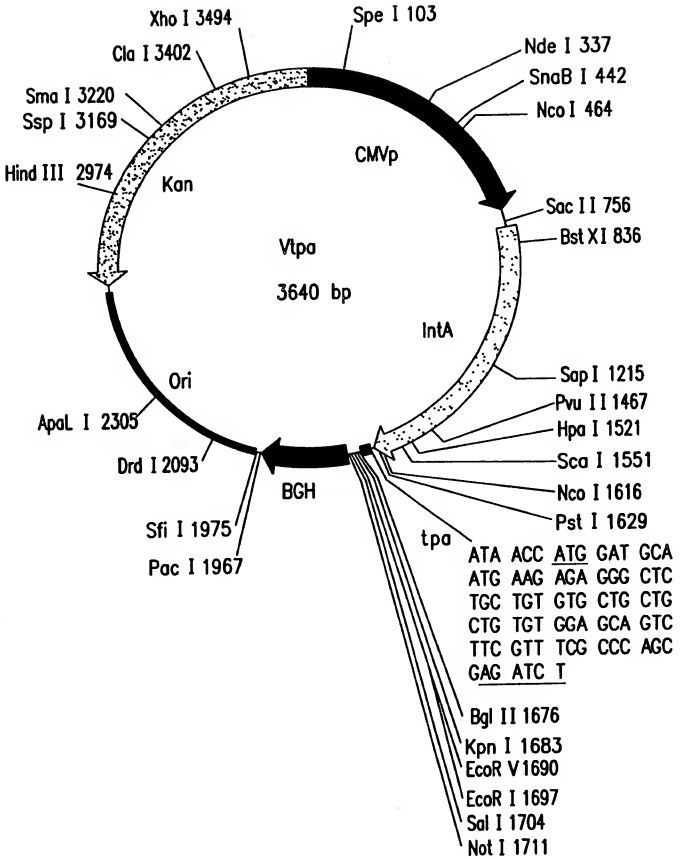
Xho I 3494
Spe I 103
Cla I 3402
Nde I 337
SnaB I 442
Sma I 3220
Nco I 464
Ssp I 3169
CMVp
Hind III 2974
Kan
Sac II 756
Bst XI 836
Vtpa
3640 bp
IntA
Sap I 1215
Ori
Pvu II 1467
ApaL I 2305
Hpa I 1521
Drd I 2093
Sca I 1551
BGH
Nco I 1616
Pst I 1629
Sfi I 1975
tpa
Pac I 1967
ATA ACC ATG GAT GCA
ATG AAG AGA GGG CTC
TGC TGT GTG CTG CTG
CTG TGT GGA GCA GTC
TTC GTT TCG CCC AGC
GAG ATC T
Bgl II 1676
Kpn I 1683
EcoR V 1690
EcoR I 1697
Sal I 1704
Not I 1711

FIG.3

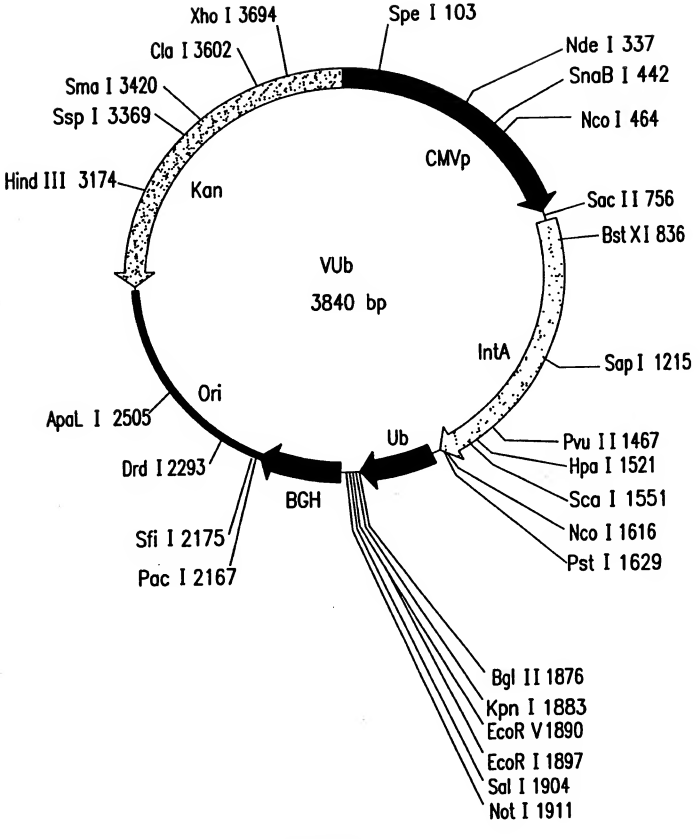
Xho I 3694
Spe I 103
Cla I 3602
Nde I 337
Sma I 3420
SnaB I 442
Ssp I 3369
Nco I 464
CMVp
Hind III 3174
Kan
Sac II 756
Bst XI 836
VUb
3840 bp
IntA
Sap I 1215
Ori
ApaL I 2505
Ub
Pvu II 1467
Drd I 2293
Hpa I 1521
BGH
Sca I 1551
Nco I 1616
Sfi I 2175
Pst I 1629
Pac I 2167
Bgl II 1876
Kpn I 1883
EcoR V 1890
EcoR I 1897
Sal I 1904
Not I 1911

FIG.4

1/1
ATG AGC ACc AAc CCc AAg CCc CAg AGg AAg
Met ser thr asn pro lys pro gln arg

61/21
GAt GTg AAG TTC CCt GGg GGa GGc CAG ATt
asp val lys phe pro gly gly gly gln ile

121/41
GGC CCC AGG cTG GGg GTG aGg GCt ACc aGG
gly pro arg leu gly val arg ala thr arg

181/61
AGG aGg CAG CCc ATC CCC AAG GCc aGg aGG
arg arg gln pro ile pro lys ala arg arg

241/81
TAC CCc TGG CCC CTg TAT GGC AAT GAa GGC
try pro trp pro leu tyr gly asn glu gly

301/101
aGg GGC TCc aGG CCc tcc TGG GGC CCC ACa
arg gly ser arg pro ser trp gly pro thr

361/121
AAg GTg ATt GAc ACC CTg ACc TGt GGC TTt
lys val ile asp thr leu thr cys gly phe

421/141
GGg GCt CCt GTg GGa GGg GTg GCt AGG GCt
gly ala pro val gly gly val ala arg ala

481/161
GGG GTG AAC TAT GCt ACt GGc AAc cTG CCt
gly val asn tyr ala thr gly asn leu pro

541/181
CTG CTc TCC TGC CTG ACa GTg CCt GCT TCT GCc
leu leu ser cys leu thr val pro ala ser ala

31/11
ACC AAg aGg AAC ACC AAC aGg aGg CCcCAG
thr lys arg asn thr asn arg arg pro gln

91/31
GTg GGa GGg GTc TAC cTG cTG CCc aGg AGG
val gly gly val tyr leu leu pro arg arg

151/51
AAG ACc TCt GAG aGG TCc CAg CCC aGg GGC
lys thr ser glu arg ser gln pro arg gly

211/71
CCt GAG GGC cGc TCC TGG GCc CAG CCt GGc
pro glu gly arg ser trp ala gln pro gly

271/81
TTt GGc TGG GCt GGc TGG CTG CTG TCC CCC
phe gly trp ala gly trp leu leu ser pro

331/111
GAC CCC aGG aGg aGG TCc aGg AAc cTG GGc
asp pro arg arg arg ser arg asn leu gly

391/131
GCt GAC CTg ATG GGc TAC ATC CCc CTg GTg
ala asp leu met gly tyr ile pro leu val

451/151
CTG GCt CAT GGg GTg AGG GTg CTG GAG GAt
leu ala his gly val arg val leu glu asp

511/171
GGc TGC TCc TTC TCc ATC TTC CTg CTG GCc
gly cys ser phe ser ile phe leu leu ala

571/191

FIG. 5

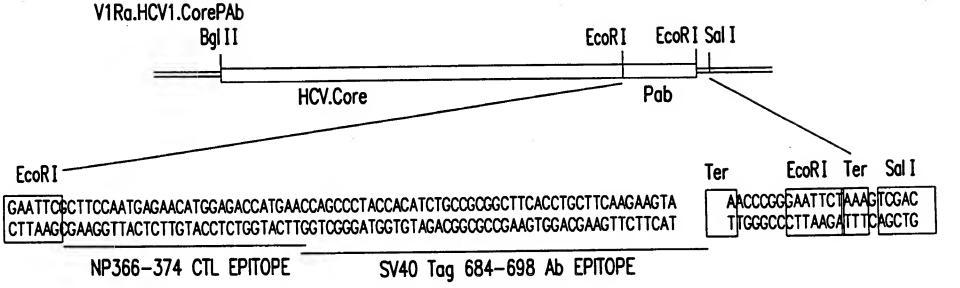
V1Ra.HCV1.CorePAb
Bgl II
EcoR I
EcoR I
Sal I
HCV.Core
Pab
EcoR I
Ter
EcoR I
Ter
Sal I
GAATTCGCTTCCAATGAGAACATGGAGACCATGAACCAGCCCTACCACATCTGCCGCGGCTTCACCTGCTTCAAGAAGTA
CTTAAGCGAAGGTTACTCTTGTACCTCTGGTACTTGGTCGGGATGGTGTAGACGGCGCCGAAGTGGACGAAGTTCTTCAT
ACCCGGGAATTCTAAAGTCGAC
TTGGGCCCTTAAGATTTCAGCTG
NP366-374 CTL EPITOPE
SV40 Tag 684-698 Ab EPITOPE
Vtpa.HCV1.CorePAb
Bgl II
EcoR I
EcoR I
Sal I
tpa
HCV.Core
Pab
V-Ub.HCV1.CorePAb
Bgl II
EcoR I
EcoR I
Sal I
UBIQUITIN
HCV.Core
PAb

FIG.6

1/1 31/11
ATG AGC ACG AAT CCT AAA CCT CAA AGA AAA ACC AAA CGT AAC ACC AAC CGC CGC CCa cAG
Met ser thr asn pro lys pro gln arg lys thr lys arg asn thr asn arg arg pro gln
61/21 91/31
GAc GTc AAg TTC CCg GGC GGt GGt CAG ATC GTT GGt GGA GTT TAC TTC TTG CCG CGC AGG
asp val lys phe pro gly gly gly gln ile val gly gly val tyr leu leu pro arg arg
121/41 151/51
GGC CCC AGG TTG GGT GTG CGC GCG ACT aGG AAG ACT TCc GAG CGG TCG CAA CCT CGT GGa
gly pro arg leu gly val arg ala thr arg lys thr ser glu arg ser gln pro arg gly
181/61 211/71
AGG CGa CAG CCT ATC CCC AAG GCt CGc CGG cCC GAG GGc AGG TCC TGG GCT CAG CCC GGG
arg arg gln pro ile pro lys ala arg arg pro glu gly arg ser trp ala gln pro gly
241/81 271/91
TAC CCt TGG CCc CTc TAt GGc AAT GAg GGC Ttc GGG TGG GCA GGa TGG CTC CTG TCC CCC
tyr pro trp pro leu tyr gly asn glu gly phe gly trp ala gly trp leu leu ser pro
301/101 331/111
CGC GGC TCT CGg CCt agT TGG GGC CCc AcT GAc CCC CGG CGt AGG TCG CGC AAT TTG GGT
arg gly ser arg pro ser trp gly pro thr asp pro arg arg arg ser arg asn leu gly
361/121 391/131
AAG GTC ATC GAT ACC CTC ACG TGC GGC TTC GCC GAC CTC ATG GGg TAC ATC CCG CTC GTc
lys val ile asp thr leu thr cys gly phe ala asp leu met gly tyr ile pro leu val
421/141 451/151
GGC GCC CCc GTA GGg GGC GTC GCC AGg GCC CTG GCG CAT GGC GTC AGG GtT cTG GAG GAC
gly ala pro val gly gly val ala arg ala leu ala his gly val arg val leu glu asp
481/161 511/171
GGG gtg AAC TAT GCA ACA GGG AAt tTg cCc GGT TGC TCT TTC TCT ATC TTC CTC cTG GCt
glu val asn tyr ala thr gly asn leu pro gly cys ser phe ser ile phe leu leu ala
541/181 571/191
CTg CTg TCc TGC CTG ACC GTC CCA GCt TCT GCT
leu leu ser cys leu thr val pro ala ser ala

FIG. 7

TABLE 3
CODON UTILIZATION IN HUMAN PROTEIN-CODING SEQUENCES

a	b	c	d	e	f	a	b	c	d	e	f
F	UUU	68	0.35	193	4.5	Y	UAU	72	0.47	153	3.6
	UUC	125	0.65				UAC	81	0.53		
L	UUA	20	0.05	445	10.4	H	CAU	44	0.42	105	2.5
	UUG	42	0.09				CAC	61	0.58		
	CUU	50	0.11			Q	CAA	50	0.26	192	4.5
	CUC	99	0.22				CAG	142	0.74		
	CUA	30	0.07			N	AAU	51	0.34	148	3.5
	CUG	204	0.46				AAC	97	0.66		
I	AUU	28	0.23	123	2.9	K	AAA	137	0.45	303	7.0
	AUC	79	0.64				AAG	166	0.55		
	AUA	16	0.13			D	GAU	79	0.38	209	4.9
M	AUG	77	1.00	77	1.8		GAC	130	0.62		
V	GUU	35	0.13	266	6.2	E	GAA	125	0.40	311	7.3
	GUC	72	0.27				GAG	186	0.60		
	GUA	25	0.09			C	UGU	44	0.30	147	3.4
	GUG	134	0.50				UGC	103	0.70		
S	UCU	59	0.17	349	8.1	W	UGG	56	1.00	56	1.3
	UCC	91	0.26			R	CGV	19	0.09	215	5.0
	UCA	37	0.11				CGC	40	0.19		
	UCG	25	0.07				CGA	22	0.10		
	AGU	37	0.11				CGG	33	0.15		
	AGC	100	0.29				AGA	51	0.24		
P	CCU	51	0.24	212	4.9		AGG	50	0.23		
	CCC	86	0.41								
	CCA	51	0.24								
	CCG	24	0.11								
T	ACU	47	0.20	238	5.6	G	GGU	36	0.15	245	5.7
	ACC	113	0.47				GGC	108	0.44		
	ACA	50	0.21				GGA	42	0.17		
	ACG	28	0.12				GGG	59	0.24		
A	GCU	91	0.31	298	7.0						
	GCC	119	0.40								
	GCA	51	0.17								
	GCG	37	0.12								

TOTAL 4285 RESIDUES EXCLUDING
N-TERMINAL METHIONINE RESIDUES

FIG.8

```
1/1                                                 31/11
atg TAT GAg GTG aGg AAt GTc TCt GGc GTc TAC CAT GTg ACc AAt GAC TGC TCC AAC TCc
M   Y   E   V   R   N   V   S   G   V   Y   H   V   T   N   D   C   S   N   S
61/21                                               91/31
tGc ATT GTc TAT GAG GCt GCt GAC ATG ATc ATG CAc ACC CCt GGc TGt GTg CCa TGt GTg
C   I   V   Y   E   A   A   D   M   I   M   H   T   P   G   C   V   P   C   V
121/41                                              151/71
aGG GAG GGc AAc TCC TCC aGg TGC TGG GTg GCc CTg ACc CCC ACc CTg GCt GCC AGG AAC
R   E   G   N   S   S   R   C   W   V   A   L   T   P   T   L   A   A   R   N
181/61                                              211/71
tcC tcC ATC CCC ACc ACc ACc ATc aGg aGg CAT GTg GAc cTG CTg GTg GGc GCt GCT GCc
S   S   I   P   T   T   T   I   R   R   H   V   D   L   L   V   G   A   A   A
241/81                                              271/91
CTg TGC TCt GCc ATG TAt GTG GGc GAc CTg TGT GGc TCT GTc TTC CTg GTg TCC CAg gTG
L   C   S   A   M   Y   V   G   D   L   C   G   S   V   F   L   V   S   Q   L
301/101                                             331/111
TTC ACC TTC TCc CCc aGg aGG TAT GAG ACt GTg CAG GAC TGC AAc TGC TCc CTg TAc CCt
F   T   F   S   P   R   R   Y   E   T   V   Q   D   C   N   C   S   L   Y   P
361/121                                             391/131
GGC CAt GTc TCt GGc CAC aGg ATG GCc TGG GAc ATG ATG ATG AAC TGG TCc CCc ACc ACt
G   H   V   S   G   H   R   M   A   W   D   M   M   M   N   W   S   P   T   T
421/141                                             451/151
GCC cTg GTG GTc TCc CAG cTg CTg aGG ATt CCc CAg GCt GTg GTG GAC ATG GTG TGT GGg
A   L   V   V   S   Q   L   L   R   I   P   Q   A   V   V   D   M   V   V   G
481/161                                             511/171
GCC CAC TGG GGc GTg CTG GCt GGC CTg GCC TAC TAc TCC ATG GTG GGc AAC TGG GCc AAG
A   H   W   G   V   L   A   G   L   A   Y   Y   S   M   V   G   N   W   A   K
541/181                                             571/191
GTg cTG ATT GTG ATG CTg CTg TTT GCt GGC GTg GAt GGc taa
V   L   I   V   M   L   L   F   A   G   V   D   G   *
```

FIG. 9

```
1/1                                                 31/11
atg ACc ACC TAt GTc TCt GTG GGc CAT GCc tcC CAG ACC ACC aGG aGg GTg GCc TCC TTC
M   T   T   Y   V   S   V   G   H   A   S   Q   T   T   R   R   V   A   S   F
61/21                                               91/31
TTC tcc CCT GGC TCt GCc CAG AAg ATC CAg CTg GTg AAC ACC AAt GGC tcc TGG CAC ATC
F   S   P   G   S   A   Q   K   I   Q   L   V   N   T   N   G   S   W   H   I
121/41                                              151/51
AAC AGG ACT GCC CTG AAt TGC AAt GAG TCC ATC AAC ATC GGc TTC TTT GCt GCc CTG TTC
N   R   T   A   L   N   C   N   E   S   I   N   T   G   F   F   A   A   L   F
181/61                                              211/71
TAt GTg AAG AAG TTC AAC TCc TCT GGc TGC TCt GAG aGg ATG GCc tct TGc aGg CCC ATT
Y   V   K   K   F   N   S   S   G   C   S   E   R   M   A   S   C   R   P   I
241/81                                              271/91
GAC AGG TTt GCc CAg GGc TGG GGc CCC ATC ACC CAT GCT GAG TCc aGg tcC TCt GAC CAg
D   R   F   A   Q   G   W   G   P   I   T   H   A   E   S   R   S   S   D   Q
301/101                                             331/111
AGG CCa TAC TGC TGG CAC TAt GCc CCc CAg CCa TGT GGc ATt GTG CCt GCc cTG CAt GTc
R   P   Y   C   W   H   Y   A   P   Q   P   C   G   I   V   P   A   L   H   V
361/121                                             391/131
TGt GGc CCt GTc TAc TGc TTC ACC CCa tcC CCT GTg GTg GTG GGc ACg ACt GAC aGg TTt
C   G   P   V   Y   C   F   T   P   S   P   V   V   V   G   T   T   D   R   F
421/141                                             451/151
GGC GTg CCC ACc TAc AAC TGG GGc GAC AAT GAG ACt GAt GTG CTg CTg CTG AAC AAC ACc
G   V   P   T   Y   N   W   G   D   N   E   T   D   V   L   L   L   N   N   T
481/161                                             511/171
aGG CCc CCc CAg GGc AAC TGG TTt GGC TGc ACc TGG ATG AAC tcC ACt GGc TTC ACC AAG
R   P   P   Q   G   N   W   F   G   C   T   W   M   N   S   T   G   F   T   K
```

FIG.10A

```
541/181                                                    571/191
ACc TGt GGc GGC CCC CCa TGc AAc ATt GGc GGc GCt GGC AAC AAC ACC cTG ACC TGC CCC
T   C   G   G   P   P   C   N   I   G   G   A   G   N   N   T   L   T   C   P
601/201                                                    631/211
ACt GAc TGC TTC aGG AAG CAt CCt GAG GCC ACc TAC ACC AAG TGt GGC TCt GGc CCa TGG
T   D   C   F   R   K   H   P   E   A   T   Y   T   K   C   G   S   G   P   W
661/221                                                    691/231
cTG ACc CCc AGG TGC ATG GTg GAC TAC CCa TAC AGg CTg TGG CAC TAC CCa TGC ACc TTC
L   T   P   R   C   M   V   D   Y   P   Y   R   L   W   H   Y   P   C   T   F
721/241                                                    751/251
AAC TTc ACC ATC TTc AAG ATC AGG ATG TAT GTG GGc GGc GTG GAG CAC AGG CTg AAt GCt
N   F   T   I   F   K   I   R   M   Y   V   G   G   V   E   H   R   L   N   A
781/261                                                    811/271
GCc TGC AAC TGG ACc aGg GGc GAG aGg TGc AAC ATt GAG GAC AGG GAc AGG TCt GAG CTg
A   C   N   W   T   R   G   E   R   C   N   I   E   D   R   D   R   S   E   L
841/281                                                    871/291
tcC CCc CTG CTg CTG TCc ACc ACt GAG TGG CAG ATc CTg CCa TGc TCC TTc ACC ACC CTg
S   P   L   L   L   S   T   T   E   W   Q   I   L   P   C   S   F   T   T   L
901/301                                                    931/311
CCt GCc CTG TCC ACT GGc cTG ATC CAt CTg CAt CAG AAC ATt GTG GAt GTG CAg TAC CTG
P   A   L   S   T   G   L   I   H   L   H   Q   N   I   V   D   V   Q   Y   L
961/321                                                    991/331
TAt GGc GTg GGc TCt GCt GTg GTc TCC ATT GTG ATC AAg TGG GAG TAt GTg CTG CTG CTg
 Y   G   V   G   S   A   V   V   S   I   V   I   K   W   E   Y   V   L   L   L
1021/341
TTC CTg CTg CTG GCt GAt GCc taa
F   L   L   L   A   D   A   *
```

FIG.10B

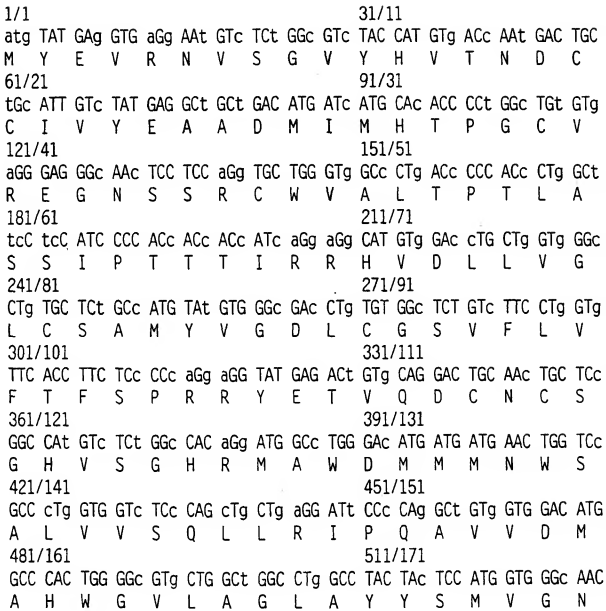
1/1
31/11
atg TAT GAg GTG aGg AAt GTc TCt GGc GTc TAC CAT GTg ACc AAt GAC TGC TCC AAC TCc
M Y E V R N V S G V Y H V T N D C S N S
61/21
91/31
tGc ATT GTc TAT GAG GCt GCt GAC ATG ATc ATG CAc ACC CCt GGc TGt GTg CCa TGt GTg
C I V Y E A A D M I M H T P G C V P C V
121/41
151/51
aGG GAG GGc AAc TCC TCC aGg TGC TGG GTg GCc CTg ACc CCC ACc CTg GCt GCC AGG AAC
R E G N S S R C W V A L T P T L A A R N
181/61
211/71
tcC tcC ATC CCC ACc ACc ACc ATc aGg aGg CAT GTg GAc cTG CTg GTg GGc GCt GCT GCc
S S I P T T T I R R H V D L L V G A A A
241/81
271/91
CTg TGC TCt GCc ATG TAt GTG GGc GAc CTg TGT GGc TCT GTc TTC CTg GTg TCC CAg cTG
L C S A M Y V G D L C G S V F L V S Q L
301/101
331/111
TTC ACC TTC TCc CCc aGg aGG TAT GAG ACt GTg CAG GAC TGC AAc TGC TCc CTg TAc CCt
F T F S P R R Y E T V Q D C N C S L Y P
361/121
391/131
GGC CAt GTc TCt GGc CAC aGg ATG GCc TGG GAc ATG ATG ATG AAC TGG TCc CCc ACc ACt
G H V S G H R M A W D M M M N W S P T T
421/141
451/151
GCC cTg GTG GTc TCc CAG cTg CTg aGG ATt CCc CAg GCt GTg GTG GAC ATG GTG GTG GGc
A L V V S Q L L R I P Q A V V D M V V G
481/161
511/171
GCC CAC TGG GGc GTg CTG GCt GGC CTg GCC TAC TAc TCC ATG GTG GGc AAC TGG GCc AAG
A H W G V L A G L A Y Y S M V G N W A K

FIG.11A

```
541/181                                                 571/191
GTg cTG ATT GTG ATG CTg CTg TTT GCt GGC GTg GAt GGc ACc ACC TAt GTc TCt GTG GGc
V   L   I   V   M   L   L   F   A   G   V   D   G   T   T   Y   V   S   V   G
601/201                                                 631/211
CAT GCc tcC CAG ACC ACC aGG aGg GTg GCc TCC TTC TTC tcc CCT GGC TCt GCc CAG AAg
H   A   S   Q   T   T   R   R   V   A   S   F   F   S   P   G   S   A   Q   K
661/221                                                 691/231
ATC CAg CTg GTg AAC ACC AAt GGC tcc TGG CAC ATC AAC AGG ACT GCC CTG AAt TGC AAt
I   Q   L   V   N   T   N   G   S   W   H   I   N   R   T   A   L   N   C   N
721/241                                                 751/251
GAG TCC ATC AAC ACT GGc TTC TTT GCt GCc CTG TTC TAt GTg AAG AAG TTC AAC TCc TCT
E   S   I   N   T   G   F   F   A   A   L   F   Y   V   K   K   F   N   S   S
781/261                                                 811/271
GGc TGC TCt GAG aGg ATG GCc tct TGc aGg CCC ATT GAC AGG TTt GCc CAg GGc TGG GGc
G   C   S   E   R   M   A   S   C   R   P   I   D   R   F   A   Q   G   W   G
841/281                                                 871/291
CCC ATC ACC CAT GCT GAG TCc aGg tcC TCt GAC CAg AGG CCa TAC TGC TGG CAC TAt GCc
P   I   T   H   A   E   S   R   S   S   D   Q   R   P   Y   C   W   H   Y   A
901/301                                                 931/311
CCc CAg CCa TGT GGc ATt GTG CCt GCc cTG CAt GTc TGt GGc CCt GTc TAc TGc TTC ACC
P   Q   P   C   G   I   V   P   A   L   H   V   C   G   P   V   Y   C   F   T
961/321                                                 991/331
CCa tcC CCT GTg GTg GTG GGc ACc ACt GAC aGg TTt GGC GTg CCC ACc TAc AAC TGG GGc
P   S   P   V   V   V   G   T   T   D   R   F   G   V   P   T   Y   N   W   G
1021/341                                                1051/351
GAC AAT GAG ACt GAt GTG CTg CTg CTg AAC AAC ACc aGG CCc CCc CAg GGc AAC TGG TTe
D   N   E   T   D   V   L   L   L   N   N   T   R   P   P   Q   G   N   W   F
```

FIG.11B

1081/361 1111/37
GGC TGc ACc TGG ATG AAC tcC ACt GGc TTC ACC AAG ACc TGt GGc GGC CCC CCa TGc AAc
G C T W M N S T G F T K T C G G P P C N
1141/381 1171/391
ATt GGc GGc GCt GGC AAC AAC ACC cTG ACC TGC CCC ACt GAc TGC TTC aGG AAG CAt CCt
I G G A G N N T L T C P T D C F R K H P
1201/401 1231/411
GAG GCC ACc TAC ACC AAG TGt GGC TCt GGc CCa TGG cTG ACc CCc AGG TGC ATG GTg GAC
E A T Y T K C G S G P W L T P R C M V D
1261/421 1291/431
TAC CCa TAC AGg CTg TGG CAC TAC CCa TGC ACc TTC AAC TTc ACC ATC TTc AAG ATC AGG
Y P Y R L W H Y P C T F N F T I F K I R
1321/441 1351/451
ATG TAT GTG GGc GGc GTG GAG CAC AGG CTg AAt GCt GCc TGC AAC TGG ACc aGg GGc GAG
M Y V G G V E H R L N A A C N W T R G E
1381/461 1411/471
aGg TGc AAC ATg GAG CAC AGG GAc AGG TCt GAG CTg tcC CCc CTG CTg CTG TCc ACc ACt
R C N I E D R D R S E L S P L L L S T T
1441/481 1471/491
GAG TGG CAG ATc CTg CCa TGc TCC TTc ACC ACC CTg CCt GCc CTG TCC ACT GGc cTG ATC
E W Q I L P C S F T T L P A L S T G L I
1501/501 1531/511
CAt CTg CAt CAG AAC ATt GTG GAt GTG CAg TAC CTG TAt GGc GTg GGc TCt GCt GTg GTc
H L H Q N I V D V Q Y L Y G V G S A V V
1561/521 1591/531
TCC ATT GTG ATC AAg TGG GAG TAt GTg CTG CTG CTg TTC CTg CTg CTG GCt GAt GCc taa
S I V I K W E Y V L L L F L L L A D A *

FIG.11C

```
1/1                                                 31/11
atg TCt GGc TCc TGG CTg AGG GAT GTc TGG GAC TGG ATc TGC ACt GTG cTG ACT GAC TCC
M   S   G   S   W   L   R   D   V   W   D   W   I   C   T   V   L   T   D   F
61/21                                               91/31
AAG ACC TGG CTg CAt TCC AAG CTg CTG CCc aGG CTG CCt GGc GAC CCa TTC TTC TCc TGc
K   T   W   L   H   S   K   L   L   P   R   L   P   G   D   P   F   F   S   C
121/41                                              151/51
CAg aGg GGc TAC AGG GGc GTc TGG aGG GGc GAT GGC GTg ATG CAg ACC ACC TGC CCa TGT
Q   R   G   Y   R   G   V   W   R   G   D   G   V   M   Q   T   T   C   P   C
181/61                                              211/71
GGc GCc CAG ATC ACt GGc CAT GTg AAg AAt GGc TCC ATG AGG ATt GTg GGc CCc AAg ACC
G   A   Q   I   T   G   H   V   K   N   G   S   M   R   I   V   G   P   K   T
241/81                                              271/91
TGc tcC AAC ACc TGG CAt GGc ACc TTC CCC ATC AAt GCc TAC ACC ACt GGc CCa TGC ACc
C   S   N   T   W   H   G   T   F   P   I   N   A   Y   T   T   G   P   C   T
301/101                                             331/111
CCa TCC CCt GCc CCc AAC TAc TCC AGG GCc CTG TGG aG GTG GCT GCT GAG GAG TAT GTG
P   S   P   A   P   N   Y   S   R   A   L   W   R   V   A   A   E   Y   V   V
361/121                                             391/131
GAg GTg ACc aGG GTG GGc GAc TTC CAC TAt GTG ACt GGC ATG ACC ACT GAC AAt GTg AAg
E   V   T   R   V   G   D   F   H   Y   V   T   G   M   T   T   D   N   V   K
421/141                                             451/151
TGC CCa TGC CAG GTg CCt GCC CCt GAg TTC TTC ACt GAg GTG GAT GGc GTG aGG cTG CAC
C   P   C   Q   V   P   A   P   E   F   F   T   E   V   D   G   V   R   L   H
481/161                                             511/171
AGG TAt GCc CCt GCc TGC AAg CCc CTg CTg aGG GAT GAG GTg ACc TTC CAG GTg GGc CTg
R   Y   A   P   A   C   K   P   L   L   R   D   E   V   T   F   Q   V   G   L
```

FIG.12A

```
541/181                                    571/191
AAC CAg TTC CCt GTg GGc TCc CAG CTg CCa TGT GAG CCt GAg CCt GAT GTg ACt GTG CTg
N   Q   F   P   V   G   S   Q   L   P   C   E   P   E   P   D   V   T   V   L
601/201                                    631/211
ACc TCC ATG CTg ACt GAg CCa TCC CAC ATc ACt GCt GAG ACt GCc AAG aGg AGG cTG GCC
T   S   M   L   T   E   P   S   H   I   T   A   E   T   A   K   R   R   L   A
661/221                                    691/231
AGg GGc TCc CCt CCa TCC cTG GCC tcC TCc TGCc tcC CAG cTG TCT GCt CCa TCc cTG
R   G   S   P   P   S   L   A   S   S   S   A   S   Q   L   S   A   P   S   L
721/241                                    751/251
AAG GCc ACc TGC ACc ACC aGg CAT GAC TCC CCt GAt GCt GAC CTg ATt GAG GCC AAC CTg
K   A   T   C   T   T   R   H   D   S   P   D   A   D   L   I   E   A   N   L
781/261                                    811/271
CTG TGG aGG CAG GAG ATG GGC GGc AAC ATC ACC aGG GTG GAG TCt GAG AAc AAG GTg GTg
L   W   R   Q   E   M   G   G   N   I   T   R   V   E   S   E   N   K   V   V
841/281                                    871/291
ATc CTg GAC TCc TTT GAg CCc CTg aGG GCt GAG GAG GAT GAG AGG GAg GTc TCt GTG GCt
I   L   D   S   F   E   P   L   R   A   E   E   D   E   R   E   V   S   V   A
901/301                                    931/311
GCt GAG ATC CTg aGG AAg tcC AGG AAG TTC CCC CCt GCc cTG CCC ATc TGG GCg aGg CCa
A   E   I   L   R   K   S   R   K   F   P   P   A   L   P   I   W   A   R   P
961/321                                    991/331
tcC TAC AAC CCa CCc CTg CTg GAG TCc TGG AAG GAC CCt GAC TAt GTg CCc CCt GTG GTg
S   Y   N   P   P   L   L   E   S   W   K   D   P   D   Y   V   P   P   V   V
1021/381                                   1051/371
CAt GGc TGC CCc CTG CCc CCc ACC ATG GCC CCa CCc ATc CCc CCa CCc aGG AGG AAG AGG
H   G   C   P   L   P   P   T   M   A   P   P   I   P   P   P   R   R   K   R
```

FIG.12B

```
1081/361                                    1111/371
ACt GTg GTg CTG ACt GAg TCC ACt GTc TCc TCT GCC cTG GCT GAG CTg GCC ACc AAG ACC
T   V   V   L   T   E   S   T   V   S   S   A   L   A   E   L   A   T   K   T
1141/381                                    1171/391
TTC GGC tcC TCt GGc TCc TCt GCt GTg GAC tct GGC ACt GCc ACG GCC CCc CCT GAC CAG
F   G   S   S   G   S   S   A   V   D   S   G   T   A   T   A   P   P   D   Q
1201/401                                    1231/411
CCa TCt GAT GAt GGc GAC AGg GGc TCt GAt GAT GAG TCc TAC TCC TCC ATG CCC CCC CTg
P   S   D   D   G   D   R   G   S   D   D   E   S   Y   S   S   M   P   P   L
1261/421                                    1291/431
GAG GGc GAG CCt GGc GAC CCt GAc CTg tct GAt GGc TCc TGG TCc ACt GTc tct GAG GAG
E   G   E   P   G   D   P   D   L   S   D   G   S   W   S   T   V   S   E   E
1321/441
GCc tct GAG GAt GTg GCc TGC TGC TCc taa
A   S   E   D   V   A   C   C   S   *
```

FIG.12C

```
1/1                                                 31/11
ATG TCc TAC ACc TGG ACt GGC GCC CTg ATC ACc CCa TGt GCt GCt GAG GAG tcC AAG CTG
M   S   Y   T   W   T   G   A   L   I   T   P   C   A   A   E   E   S   K   L
61/21                                               91/31
CCC ATC AAc CCc cTG tcC AAC TCc cTG CTG aGg CAt CAC AAC ATG GTc TAt GCC ACc ACc
P   I   N   P   L   S   N   S   L   L   R   H   H   N   M   V   Y   A   T   T
121/41                                              151/51
TCc aGg tct GCt GGC CTg aGG CAG AAg AAG GTg ACC TTT GAC AGg CTG CAt GTg CCt GAt
S   R   S   A   G   L   R   Q   K   K   V   T   F   D   R   L   H   V   P   C
181/61                                              211/71
GAC CAc TAC aGG GAt GTG CTg AAG GAG ATG AAG GCc AAG GCc TCC ACt GTg AAG GCg AAg
D   H   Y   R   D   V   L   K   E   M   K   A   K   A   S   T   V   K   A   K
241/81                                              271/91
CTg CTg TCT GTg GAg GAg GCC TGC AAG CTG ACc CCt CCc CAC TCt GCC AGg TCC AAg TTT
L   L   S   V   E   E   A   C   K   L   T   P   P   H   S   A   R   S   K   F
301/101                                             331/111
GGC TAT GGc GCc AAG GAt GTg aGG AAC CTg TCC tcC AAG GCt GTg AAC CAC ATC CAC TCt
G   Y   G   A   K   D   V   R   N   L   S   S   K   A   V   N   H   I   H   S
361/121                                             391/131
GTc TGG AAG GAC cTG CTG GAg GAC ACT GAg ACc CCc ATT GAC ACc ACC ATC ATG GCc AAg
V   W   K   D   L   L   E   D   T   E   T   P   I   D   T   T   I   M   A   K
421/141                                             451/151
AAT GAG GTc TTC TGT GTg CAg CCt GAG AAg GGc GGC aGg AAG CCt GCC aGg CTg ATt GTc
N   E   V   F   C   V   Q   P   E   K   G   G   R   K   P   A   R   L   I   V
481/161                                             511/171
TTC CCt GAg CTg GGc GTg aGg GTG TGt GAG AAg ATG GCC CTg TAt GAt GTG GTc TCC ACc
F   P   E   L   G   V   R   V   C   E   K   M   A   L   Y   D   V   V   S   T
```

FIG.13A

```
541/181                                   571/191
CTg CCc CAG GCt GTG ATG GGC TCC TCc TAt GGc TTC CAG TAC TCc CCT GGc CAG aGG GTg
L   P   Q   A   V   M   G   S   S   Y   G   F   Q   Y   S   P   G   Q   R   V
601/201                                   631/211
GAG TTC CTG GTG AAT GCC TGG AAg TCc AAG AAg AAC CCc ATG GGC TTt GCc TAc TGC ACC
E   F   L   V   N   A   W   K   S   K   K   N   P   M   G   F   A   Y   C   T
661/221                                   691/231
aGg TGc TTT GAC TCc ACt GTg ACT GAG tcT GAc ATC aGg GTg GAG GAG TCc ATc TAC CAg
R   C   F   D   S   T   V   T   E   S   D   I   R   V   E   E   S   I   Y   Q
721/241                                   751/251
TGc TGT GAC cTG GCt CCt GAG GCC AGg CAG GTg ATc AGG TCc CTg ACt GAG aGG CTg TAc
C   C   D   L   A   P   E   A   R   Q   V   I   R   S   L   T   E   R   L   Y
781/261                                   811/271
ATt GGc GGC CCC CTG ACc AAc TCc AAg GGc CAG AAC TGt GGc TAc aGg aGG TGC aGg GCC
I   G   G   P   L   T   N   S   K   G   Q   N   C   G   Y   R   R   C   R   A
841/281                                   871/291
tct GGc GTG CTG ACc ACT AAC TGt GGc AAc ACC CTg ACc TGc TAC cTG AAG GCC TCT GCt
S   G   V   L   T   T   N   C   G   N   T   L   T   C   Y   L   K   A   S   A
901/301                                   931/311
GCt TGc aGg GCT GCc AAG CTg CAt GAC TGC ACc ATG CTg GTc TGt GGc GAt GAC CTg GTg
A   C   R   A   A   K   L   H   D   C   T   M   L   V   C   G   D   D   L   V
961/321                                   991/331
GTg ATC TGT GAg tct GCt GGc ACC CAG GAG GAt GCt GCc tcC CTg aGg GTc TTC ACt GAG
V   I   C   E   S   A   G   T   Q   E   D   A   A   S   L   R   V   F   T   E
1021/341                                  1051/351
GCc ATG ACc AGG TAC TCT GCC CCc CCt GGc GAC CCt CCC CAg CCt GAg TAt GAC cTG GAG
A   M   T   R   Y   S   A   P   P   G   D   P   P   Q   P   E   Y   D   L   E
```

FIG.13B

1081/361 1111/371
cTg ATc ACc TCc TGC TCC TCC AAt GTc TCt GTg GCc CAt GAt GCc TCT GGC AAG aGG GTc
L I T S C S S N V S V A H D A S G K R V
1141/381 1171/391
TAC TAC CTg ACc aGg GAC CCC ACC ACC CCc CTg GCc AGG GCt GCc TGG GAg ACt GCc AGg
Y Y L T R D P T T P L A R A A W E T A R
1201/401 1231/411
CAC ACc CCt GTg AAC TCC TGG CTg GGC AAC ATC ATC ATG TAt GCc CCC ACC CTG TGG GCc
H T P V N S W L G N I I M Y A P T L W A
1261/421 1291/431
AGG ATG ATc CTG ATG ACC CAC TTC TTC TCC ATC CTg CTg GCc CAG GAG CAg CTg GAg AAg
R M I L M T H F F S I L L A Q E Q L E K
1321/441 1351/451
GCC CTG GGc TGc CAG ATt TAt GGc GCC ACc TAC TTC ATT GAg CCc CTg GAC CTg CCc CAG
A L G C Q I Y G A T Y F I E P L D L P Q
1381/461 1411/471
ATC ATc CAG aGg CTg CAt GGc CTg tct GCc TTc TCc CTg CAC tcc TAC TCc CCt GGc GAg
I I Q R L H G L S A F S L H S Y S P G E
1441/481 1471/491
ATC AAc AGG GTG GCc TCc TGC CTg AGG AAg CTg GGc GTg CCc CCC cTG aGg GTg TGG AGg
I N R V A S C L R K L G V P P L R V W R
1501/501 1531/511
GAc aGG GCC AGg tct GTg aGg GCc AAG CTg CTG TCC CAG GGc GGc AGG GCt GCC ACc TGT
H R A R S V R A K L L S Q G G R A A T C
1561/521 1591/531
GGC AAG TAC CTg TTC AAC TGG GCt GTG AGG ACC AAG CTg AAg CTg ACc CCc ATc CCt GCT
G K Y L F N W A V R T K L K L T P I P A

FIG.13C

```
1621/541                                    1651/551
GCc TCC CAG cTG GAC cTg TCt GGC TGG TTt GTg GCT GGc TAC tct GGc GGc GAC ATc TAc
A   S   Q   L   D   L   S   G   W   F   V   A   G   Y   S   G   G   D   I   Y
1681/561                                    1711/571
CAC tcC CTG TCc aGg GCC aGg CCC aGg TGG TTC ATG TGG TGC CTg CTg CTg CTg TCT GTg
H   S   L   S   R   A   R   P   R   W   F   M   W   C   L   L   L   L   S   V
1741                                        1771/591
GGc GTg GGC ATC TAC CTG CTg CCC AAC aGG TGA
G   V   G   I   Y   L   L   P   N   R   *
```

FIG.13D